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British Standards Institution
Report

No. 10—1904.

British Engineering Standards Association.

(*Incorporated 1918*).

Formed in 1901 as The Engineering Standards Committee,

by

The Institution of Civil Engineers.
The Institution of Mechanical Engineers.
The Institution of Naval Architects.
The Iron and Steel Institute.
The Institution of Electrical Engineers.

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BRITISH STANDARD TABLES OF PIPE FLANGES.

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British Engineering Standards Association

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FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE,

BY

THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
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BRITISH ENGINEERING STANDARDS ASSOCIATION.

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* Succeeded the late Sir John Wolfe Barry, K.C.B., February, 1918.

BRITISH ENGINEERING STANDARDS ASSOCIATION.

The following are lists of Members of the Committee on Pipe Flanges, and of the Sub-Committee who were entrusted with the drafting of the Report and Standard Lists.

COMMITTEE ON PIPE FLANGES.

December, 1904.

Chairman, Mr. William H. Maw.
Admiralty, Mr. W. E. Smith, C.B. ; Engineer-Commander A. R. Emdin, R.N.
Institution of Mechanical Engineers, *Mr. E. B. Ellington ; *Mr. Henry Davey.
Institution of Electrical Engineers, Mr. W. H. Patchell.
North-East Coast Institution of Engineers and Shipbuilders, Mr. Andrew Laing.
Institution of Engineers and Shipbuilders in Scotland, Mr. John Steven.
Institution of Marine Engineers, Mr. J. Dewrance.
Institution of Heating and Ventilating Engineers, Mr. R. E. Atkinson.
Association of Railway Locomotive Engineers, *Mr. T. Hurry Riches.
British Tube Association, Mr. Frank Herbert.
Mr. J. Hopkinson; Mr. Robert Hopkinson; Mr. T. Harris Spencer; Mr. G. Watson.

* Since deceased.

SUB-COMMITTEE ON PIPE FLANGES.

December, 1904.

Chairman, Mr. William H. Maw.
Engineer-Commander A. R. Emdin, R.N. ; Mr. W. H. Patchell ; Mr. J. Dewrance ; Mr. R. E. Atkinson ; Mr. Frank Herbert ; Mr. Robert Hopkinson ; Mr. T. Harris Spencer ; Mr. G. Watson.

PREFACE

The Committee on Pipe Flanges was appointed at a meeting of the Main Committee on February 13th, 1903.

At the first meeting of the Pipe Flange Committee, held on June 30th, 1903, a Sub-Committee was appointed to collate information and prepare a preliminary Report to the Committee.

The Members of the Sub-Committee first met on July 10th, 1903, and held in all 24 meetings, at which they considered a large amount of matter collected from Manufacturers and Users of pipes of various classes. They were also greatly assisted by numerous experimental tests on specimens of flanges and varieties of joints kindly carried out by the Admiralty, by Messrs. Dewrance & Co., by Messrs. John Hopkinson & Co., Ltd., by Messrs John Spencer, Ltd., and by Messrs. Stewarts and Lloyds, Ltd., while, further, they were indebted to Messrs. Burstall and Monkhouse for making experiments on the strength of samples of Admiralty Bronze supplied by Messrs Dewrance & Co.

The Report prepared by the Sub-Committee, after being circulated amongst the Members, was considered by the Pipe Flange Committee at a meeting held on October 18th, 1904, and was adopted.

This Report was approved by the Main Committee at their meeting on December 8th, 1904.

REPORT

OF THE

COMMITTEE ON PIPE FLANGES.

Classification of Pressures.

1. The Committee recommend that flanges, &c., should be standardised in four classes, as follows :—

(1.) **Low-Pressure Standard,** for steam pressures up to **55** lbs., and water pressures up to **200** lbs. per square inch.

(2.) **Intermediate-Pressure Standard,** for steam pressures over **55** lbs., but not exceeding **125** lbs. per square inch.

(3.) **High-Pressure Standard,** for steam pressures over **125** lbs., but not exceeding **225** lbs. per square inch.

(4.) **Extra High-Pressure Standard,** for steam pressures over **225** lbs., but not exceeding **325** lbs. per square inch.

General Dimensions of Flanges.

2. Before giving the Standard dimensions of flanges determined upon for the pressures above named, it may be well to state the general principles which the Committee adopted as a result of their enquiries.

Number of Bolts.

3. In the first place it was decided that the number of bolts used should in all cases be a multiple of four, and that the bolt-holes should be so placed that spaces between them are bisected by the main centre lines. The Committee are quite aware that in the case of flanges for certain sizes of pipes—and especially of those for 2½ in. pipes—the adoption of multiples of four for the number of bolts involves some change of practice; but, after carefully discussing the opinions and experimental data brought before them they are convinced that the advantages resulting from the adoption of such a principle outweigh the disadvantages.

Bolts.

4. For determining the sizes of bolts it has been assumed that in the case of a joint just on the point of leaking, the full working pressure might be exerted over the area of a circle just touching the inner sides of the bolt-holes, and the sectional area of the bolts at the bottom of the threads has been fixed to meet this contingency. In the case of the smaller sizes of pipes, allowances have also been made for undue stresses in making the joints. It is considered desirable that all nuts should be chamfered on the side bearing on the flange, and that the bearing surfaces of the heads, nuts and flanges should be trued.

Sizes of Bolt-Holes.

5. The sizes of bolt-holes decided upon were :—For $\frac{1}{2}$-in. and $\frac{5}{8}$-in. bolts the diameters of the holes to be $\frac{1}{16}$-in. larger than the diameters of the bolts ; and for larger sizes of bolts, $\frac{1}{8}$-in.

Diameters of Flanges.

6. Practically the sizes of flanges are governed by the necessity of adopting such diameters as will meet the requirements of makers of stop-valves and similar fittings. The diameters decided upon by the Committee are the smallest which will satisfy these requirements. The requirements of the valve makers agree very closely with those which exist in the case of cast-iron pipes, or in pipes with riveted-on flanges ; while in the case of pipes with welded-on flanges, although the diameter of such flanges might be reduced, there are manifest disadvantages in having two sizes of flanges when connections have to be made to valves or other fittings. Experiments have shown, however, that with these welded-on flanges the strength of the joints is materially increased by reducing the size of the flanges, while the cost is, of course, also diminished. Under these circumstances the Committee consider that in the case of long lines of pipes having welded-on flanges, it should be permissible to make such flanges of the dimensions given in Table III.

Thicknesses of Flanges.

7. In the opinion of the Committee, the Standard thicknesses tabulated for the various types of flanges are the minimum thicknesses consistent with satisfactorily meeting the requirements of ordinary practice.

8. The enquiries made by the Committee have shown that the test pressures specified for application to the permanent joints of steam pipes when erected do not usually exceed twice the working pressure, and they consider that the thicknesses which they recommend will satisfactorily meet the requirements of those users who desire to subject the permanent steam joints to such a test pressure. At the same time they consider that in the case of high pressures such a test is undesirable, and that a test of the permanent joints by the application of a hydraulic pressure not exceeding the working pressure by more than 100 lbs. per square inch meets all requirements, as, in the majority of cases, the test pressure applied is much lower than this ; in fact, many users are content with the application of the working pressure only.

9. These remarks on test pressures do not apply to the testing of pipes and fittings individually by hydraulic pressure before the permanent steam joints are made In such tests, made to prove the quality of the material and workmanship, joints can readily be made, by means of elastic jointing material, to stand high pressures, although such joints would not be suitable for permanent use with steam.

(1.) Low-pressure Standard. (See Table I.)

10. The dimensions of flanges and bolts requisite for a steam pressure of 55 lbs. per square inch are given in Table I. These are also suitable for water pipes, other than boiler feed pipes, subject to a pressure not exceeding 200 lbs. per square inch, as elastic jointing material can be used. The diameters of flanges for pipes in excess of 1 in. internal diameter are the same as those for the next smaller size given in Table II.

(2.) Intermediate-Pressure Standard
(3.) High-Pressure Standard (See Table II.)
(4.) Extra High-Pressure Standard

11. The Committee consider that in these three Standards it is highly desirable that the diameters of flanges, diameters of bolt circles and numbers of bolts should be identical, and that the differences should consist in variations of the thicknesses of flanges and of diameters of bolts only.

12. The dimensions of flanges and bolts requisite for steam pressures of 125, 225, and 325 lbs. per square inch are given in Table II.

Flanges for Pipe Lines. (See Table III.)

13. The dimensions of flanges and bolts suitable for Pipe Lines with welded-on flanges (see paragraph 6, page 8) are given in Table III.

Standard Flanged Bends and Tees.

14. In addition to preparing the Standard dimensions of flanges the Committee have drawn up Standard dimensions for Bends and Tees.

Standard Flanged Bends and Tees of Cast Metal. (See Table IV.)

15. For short bends and tees the dimensions from centre line to face of flange are equal to the diameter of pipe plus 3-ins., as shown by the sketches and Table IV. This Table also gives the radii of the centre lines of the bends recommended by the Committee.

Standard Flanged Bends of Wrought Iron and Steel. (See Table V.)

16. The dimensions of long bends of this type are practically determined by the requirements of manufacture, and after careful consideration of the questions involved the Committee have decided on recommending for adoption the dimensions given in Table V. This Table gives the sizes of long bends for pipes up to 20 ins. in diameter, that being the maximum diameter at present capable of being dealt with in bends of this type.

TABLE I.

DIMENSIONS OF BRITISH STANDARD PIPE FLANGES

FOR WORKING STEAM PRESSURES UP TO 55 LBS. PER SQUARE INCH AND FOR WATER PRESSURES UP TO 200 LBS. PER SQUARE INCH.

This Table does not apply to boiler feed pipes, or other water pipes subject to exceptional shocks.

1	2	3	4	5	6	7	8	9
					Thickness of Flanges.			
Internal Diameter of Pipe.	Diameter of Flange.	Diameter of Bolt Circle.	No. of Bolts.	Diameter of Bolts.	Cast Iron, and Steel or Iron Welded-on.	Cast Steel and Bronze.	Stamped or Forged Wrought Iron or Steel.	Internal Diameter of Pipe.
ins.	ins.	ins.		ins.	ins.	ins.	ins.	ins.
½	3¾	2⅝	4	½	½	⅜	3/16	½
¾	4	2⅞	4	½	½	⅜	3/16	¾
1	4½	3¼	4	½	½	⅜	3/16	1
1¼	4¾	3 7/16	4	½	⅝	½	¼	1¼
1½	5¼	3⅞	4	½	⅝	½	¼	1½
*1¾	5½	4⅛	4	½	⅝	½	¼	*1¾
2	6	4½	4	⅝	¾	9/16	5/16	2
2½	6½	5	4	⅝	¾	9/16	5/16	2½
3	7¼	5¾	4	⅝	¾	9/16	⅜	3
3½	8	6½	4	⅝	¾	9/16	⅜	3½
4	8½	7	4	⅝	⅞	11/16	⅜	4
*4½	9	7½	8	⅝	⅞	11/16	7/16	*4½
5	10	8¼	8	⅝	⅞	11/16	½	5
6	11	9¼	8	⅝	⅞	11/16	½	6
7	12	10¼	8	⅝	1	¾	½	7
8	13¼	11½	8	⅝	1	¾	½	8
9	14½	12¾	8	⅝	1	¾	⅝	9
10	16	14	8	¾	1	¾	⅝	10
*11	17	15	8	¾	1⅛	⅞	⅝	*11
12	18	16	12	¾	1⅛	⅞	⅝	12
*13	19¼	17¼	12	¾	1⅛	⅞	¾	*13
14	20¾	18½	12	⅞	1¼	1	¾	14
15	21¾	19½	12	⅞	1¼	1	¾	15
16	22¾	20½	12	⅞	1¼	1	¾	16
*17	24	21¾	12	⅞	1⅜	1⅛	⅞	*17
18	25¼	23	12	⅞	1⅜	1⅛	⅞	18
*19	26½	24	12	⅞	1⅜	1⅛	⅞	*19
20	27¾	25¼	16	⅞	1½	1¼	1	20
21	29	26½	16	⅞	1½	1¼	1	21
*22	30	27½	16	1	1½	1¼	1	*22
*23	31	28½	16	1	1⅝	1⅜	1⅛	*23
24	32½	29¾	16	1	1⅝	1⅜	1⅛	24

* The Committee suggests that, for general use, these sizes be dispensed with.

Bolt holes—For ½-in. and ⅝-in. bolts the diameters of the holes to be 1/16-in. larger than the diameters of the bolts, and for larger sizes of bolts ⅛-in. Bolt holes to be drilled off centre lines.

TABLE II.
DIMENSIONS OF BRITISH STANDARD PIPE FLANGES FOR WORKING STEAM PRESSURES UP TO 125 LBS., 225 LBS. AND 325 LBS. PER SQUARE INCH.

1	2	3	4	5	6	7	8	9	10	11	12	13
Internal Diameter of Pipe.	Diameter of Flange.	Diameter of Bolt Circle.	Number of Bolts.	Diameter of Bolts.		Thickness of Flanges.						Internal Diameter of Pipe.
						Cast Iron, and Steel or Iron Welded-on.			Steel (Cast or Riveted-on) and Bronze.			
	125 lbs. 225 lbs. 325 lbs.	125 lbs. 225 lbs. 325 lbs.	125 lbs. 225 lbs. 325 lbs.	125 lbs. 225 lbs.	325 lbs.	125 lbs.	225 lbs.	325 lbs.	125 lbs.	225 lbs.	325 lbs.	
ins.	ins.	ins.		ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
½	3¾	2⅞	4	½	½	½	½	⅝	⅜	7/16	⅝	½
¾	4	2⅞	4	½	½	½	½	⅝	⅜	7/16	⅝	¾
1	4¾	3 7/16	4	⅝	⅝	½	⅝	¾	⅜	½	11/16	1
1¼	5¼	3⅞	4	⅝	⅝	⅝	⅝	¾	½	½	11/16	1¼
1½	5½	4⅛	4	⅝	⅝	⅝	¾	⅞	½	9/16	¾	1½
*1¾	6	4½	4	⅝	⅝	⅝	¾	⅞	½	9/16	¾	*1¾
2	6½	5	4	⅝	¾	¾	⅞	1	⅝	11/16	⅞	2
2½	7¼	5¾	8	⅝	¾	¾	⅞	1	⅝	11/16	⅞	2½
3	8	6½	8	⅝	¾	¾	1	1¼	⅝	¾	1	3
3½	8½	7	8	⅝	¾	⅞	1	1¼	¾	¾	1	3½
4	9	7½	8	⅝	¾	⅞	1⅛	1⅜	¾	⅞	1⅛	4
*4½	10	8¼	8	¾	⅞	⅞	1⅛	1⅜	¾	⅞	1⅛	*4½
5	11	9¼	8	¾	⅞	1	1¼	1½	⅞	1	1¼	5
6	12	10¼	12	¾	⅞	1	1¼	1½	⅞	1	1¼	6
7	13¼	11½	12	¾	⅞	1	1⅜	1⅝	⅞	1⅛	1⅜	7
8	14½	12¾	12	¾	⅞	1⅛	1⅜	1⅝	1	1⅛	1⅜	8
9	16	14	12	⅞	1	1⅛	1½	1¾	1	1¼	1½	9
10	17	15	12	⅞	1	1⅛	1½	1⅞	1	1¼	1⅝	10
*11	18	16	16	⅞	1	1¼	1⅝	1⅞	1⅛	1⅜	1⅝	*11
12	19¼	17¼	16	⅞	1	1¼	1⅝	2	1⅛	1⅜	1¾	12
*13	20¾	18½	16	1	1⅛	1¼	1¾	2	1⅛	1½	1¾	*13
14	21¾	19½	16	1	1⅛	1⅜	1¾	2⅛	1¼	1½	1⅞	14
15	22¾	20½	16	1	1⅛	1⅜	1⅞	2⅛	1¼	1⅝	1⅞	15
16	24	21¾	20	1	1⅛	1⅜	1⅞	2¼	1¼	1⅝	2	16
*17	25¼	23	20	1	1⅛	1½	2	2⅜	1⅜	1¾	2⅛	*17
18	26½	24	20	1⅛	1¼	1½	2	2⅜	1⅜	1¾	2⅛	18
*19	27¾	25¼	20	1⅛	1¼	1½	2⅛	2½	1⅜	1⅞	2¼	*19
20	29	26½	24	1⅛	1¼	1⅝	2⅛	2½	1½	1⅞	2¼	20
21	30	27½	24	1⅛	1¼	1⅝	2¼	2⅝	1½	2	2⅜	21
*22	31	28½	24	1⅛	1¼	1⅝	2¼	2⅝	1½	2	2⅜	*22
*23	32½	29¾	24	1¼	1⅜	1¾	2⅜	2¾	1⅝	2⅛	2½	*23
24	33½	30¾	24	1¼	1⅜	1¾	2⅜	2¾	1⅝	2⅛	2½	24

* The Committee suggests that, for general use, these sizes be dispensed with.

Bolt-holes—For ½-in. and ⅝-in. bolts the diameters of the holes to be 1/16-in. larger than the diameters of the bolts, and for larger sizes of bolts ⅛-in. Bolt-holes to be drilled off centre lines.

TABLE III.

DIMENSIONS OF BRITISH STANDARD

WELDED ON FLANGES FOR PIPE LINES

FOR WORKING STEAM PRESSURES UP TO 125 LBS., 225 LBS. AND 325 LBS. PER SQUARE INCH.

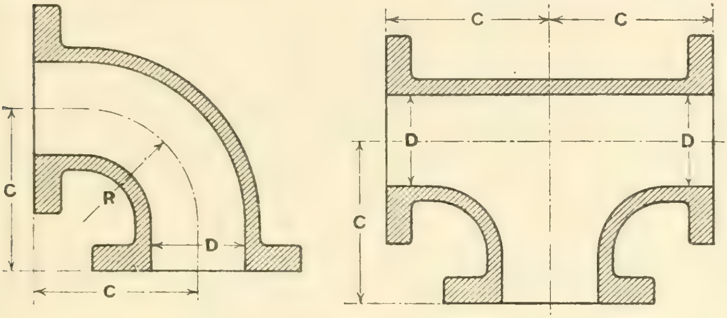
1	2	3	4	5	6	7	8	9	10
Internal Diameter of Pipe.	Diameter of Flange.	Diameter of Bolt Circle.	Number of Bolts.	Diameter of Bolts.		Thickness of Steel or Iron Welded-on Flanges.			Internal Diameter of Pipe.
				125 lbs. 225 lbs.	325 lbs.	125 lbs.	225 lbs.	325 lbs.	
ins.	ins.	ins.		ins.	ins.	ins.	ins.	ins.	ins.
2	6	4½	4	⅝	⅝	½	9/16	¾	2
2½	6½	5	4	⅝	¾	⅝	11/16	⅞	2½
3	7¼	5¾	8	⅝	¾	⅝	11/16	⅞	3
3½	8	6½	8	⅝	¾	⅝	¾	1	3½
4	8½	7	8	⅝	¾	¾	¾	1	4
*4½	9	7½	8	⅝	¾	¾	⅞	1⅛	*4½
5	10	8¼	8	¾	⅞	¾	⅞	1⅛	5
6	11	9¼	8	¾	⅞	⅞	1	1¼	6
7	12	10¼	12	¾	⅞	⅞	1	1¼	7
8	13¼	11½	12	¾	⅞	⅞	1⅛	1⅜	8
9	14½	12¾	12	¾	⅞	1	1⅛	1⅜	9
10	16	14	12	⅞	1	1	1¼	1½	10
*11	17	15	12	⅞	1	1	1¼	1⅝	*11
12	18	16	16	⅞	1	1⅛	1⅜	1⅝	12
*13	19¼	17¼	16	⅞	1	1⅛	1⅜	1¾	*13
14	20¾	18½	16	1	1⅛	1⅛	1½	1¾	14
15	21¾	19½	16	1	1⅛	1¼	1½	1⅞	15
16	22¾	20½	16	1	1⅛	1¼	1⅝	1⅞	16
*17	24	21¾	20	1	1⅛	1¼	1⅝	2	*17
18	25¼	23	20	1	1⅛	1⅜	1¾	2⅛	18
*19	26½	24	20	1⅛	1¼	1⅜	1¾	2⅛	*19
20	27¾	25¼	20	1⅛	1¼	1⅜	1⅞	2¼	20
21	29	26½	24	1⅛	1¼	1½	1⅞	2¼	21
*22	30	27½	24	1⅛	1¼	1½	2	2⅜	*22
*23	31	28½	24	1⅛	1¼	1½	2	2⅜	*23
24	32½	29¾	24	1¼	1⅜	1⅝	2⅛	2½	24

*The Committee suggests that, for general use, these sizes be dispensed with.

Bolt-holes—For ½-in. and ⅝-in. bolts the diameters of the holes to be 1/16-in. larger than the diameters of the bolts, and for larger sizes of bolts ⅛-in. Bolt-holes to be drilled off centre lines.

TABLE IV.

DIMENSIONS OF BRITISH STANDARD
SHORT BENDS AND TEES OF CAST METAL
FOR ALL PRESSURES UP TO 325 LBS. PER SQUARE INCH.



These Sketches are merely for the purpose of identifying the dimensions given in the Table, and are not to scale.

D	C =D+3 ins.	R	D	C =D+3 ins.	R
Internal Diameter of Pipe.	Centre to Flange Face.	Radius of Centre-line of Bend.	Internal Diameter of Pipe.	Centre to Flange Face.	Radius of Centre-line of Bend.
ins.	ins.	ins.	ins.	ins.	ins.
½	3½	2½	9	12	9
¾	3¾	2¾	10	13	10
1	4	2¾	*11	14	10¾
1¼	4¼	3	12	15	11¾
1½	4½	3	*13	16	12½
*1¾	4¾	3¼	14	17	13½
2	5	3¼	15	18	14¼
2½	5½	3¾	16	19	15¼
3	6	4	*17	20	16
3½	6½	4½	18	21	17
4	7	4¾	*19	22	17¾
*4½	7½	5¼	20	23	18¾
5	8	5½	21	24	19½
6	9	6½	*22	25	20½
7	10	7¼	*23	26	21¼
8	11	8¼	24	27	22¼

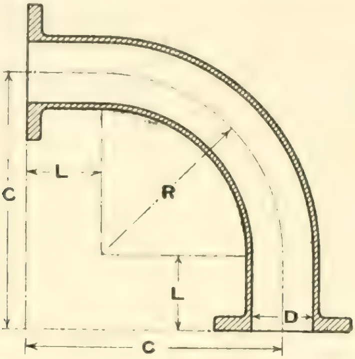
*The Committee suggests that, for general use, these sizes be dispensed with.

In Unequal Tees having branches varying in diameter in a ratio of not more than 3 to 1, the dimensions are to be those given in the above Table for the largest diameter branch.

TABLE V.

DIMENSIONS OF BRITISH STANDARD

LONG BENDS OF WROUGHT IRON AND STEEL.



This Sketch is merely for the purpose of identifying the dimensions given in the Table, and is not to scale.

D	L	C		R	D	L	C		R
Internal Diameter of Pipe.	Length of Straight.	Centre to Flange Face.		Radius of Centre-line.	Internal Diameter of Pipe.	Length of Straight.	Centre to Flange Face.		Radius of Centre-line.
ins.	ins.	ins.		ins	ins.	ins.	ins.		ins.
½	2½	4½		2	7	7	31½	R = 3½ D.	24½
¾	2½	5		2½	8	8	36		28
1	3	6	R = 3 D.	3	9	8	39½		31½
1¼	3	6¾		3¾	10	9	49	R = 4 D.	40
1½	3	7½		4½	*11	9	53		44
*1¾	3½	8¾		5¼	12	10	58		48
2	3½	9½		6	*13	11	69½	R = 4½ D.	58½
2½	4	11½		7½	14	11	74		63
3	4	13		9	15	12	79½		67½
3½	5	15½		10½	16	13	93	R = 5 D.	80
4	5	17		12	*17	14	99		85
*4½	6	19½		13½	18	14	104		90
5	6	21		15	*19	15	119½	R = 5½ D.	104½
6	7	25		18	20	16	126		110

* The Committee suggests that, for general use, these sizes be dispensed with.

British Engineering Standards Association.

PRICE LIST
OF
BRITISH STANDARD SPECIFICATIONS AND REPORTS.

JULY, 1918.

(*This List cancels all previous Lists.*)

NOTE.—*Directly the necessary arrangements have been completed the Publications of the Association, with a few exceptions, will also be issued in French, Italian, Spanish and Russian. Both the English Editions and the Foreign Translations will be published in octavo form, and will be available at 1/- net per copy or its equivalent in Foreign moneys.*

Report No.		Net.	Post free.
1	**Rolled Sections for Structural Purposes,** Lists of (Revised December, 1914)	2/-	2/2
2	**Tramway Rails and Fishplates,** Specification and Sections of	21/-	21/3
3	**Influence of Gauge Length and Section of Test Bar on the Percentage of Elongation,** Report on, by Professor W. C. Unwin, F.R.S.	5/-	5/2
4	**Beams,** Properties of (included in No. 6)	Withdrawn.	
5	**Locomotives for Indian Railways,** First Report on (Superseded by No. 50)	Withdrawn.	
6	**Rolled Sections for Structural Purposes,** Properties of This Publication contains Sizes, Areas, Weights, Moments of Inertia, Moments of Resistance, etc., for all Standard Sections of Structural Steel.	2/6	2/9
7	**Copper Conductors,** Tables of (Revised March, 1910)	5/-	5/3
8	**Tramway Poles,** Specification for Tubular	5/-	5/2
9	**Railway Rails,** Specification and Sections of Bull Head (Revised July, 1909)	21/-	21/3
10-1904	**Pipe Flanges,** Tables of	1/-	1/2
11	**Railway Rails,** Specification and Sections of Flat Bottom (Revised July, 1909)	21/-	21/4
12	**Portland Cement,** Specification for (Revised March, 1915)	5/-	5/3
13	**Steel for Shipbuilding,** Specification for Structural (Revised September, 1910)	5/-	5/2
14-1907	**Steel for Marine Boilers,** Specification for Structural	1/-	1/2
15-1912	**Steel for Bridges,** etc., and General **Building Construction,** Specification for Structural	1/-	1/2
16	**Telegraph Material,** Specification for	21/-	21/5
17	**Electrical Machinery,** Report on (Superseded by No. 72–1917)	Withdrawn.	
18	**Tensile Test Pieces,** Forms of (Revised November, 1910)	Gratis	-/2
19	**Temperature Experiments on Field Coils** of Electrical Machines, Report on	10/6	10/11
20	**Screw Threads,** Report on (Revised February, 1913)	2/6	2/8
21-1909	**Pipe Threads** for Iron or Steel Pipes and Tubes, Report on	1/-	1/2
22	**Insulating Materials,** Report on the **Effect of Temperature** on	Withdrawn.	
23-1905	**Trolley Groove and Wire,** Standards for	1/-	1/2
24	**Railway Rolling Stock,** Specifications for **Material** used in the Construction of (Revised 1911)	21/-	21/5
25	**Errors in Workmanship,** Report on	Withdrawn.	
26	**Locomotives for Indian Railways,** Second Report on (Superseded by No. 50).	Withdrawn.	
27	**Limit Gauges for Running Fits,** Report on Standard Systems of	5/-	5/2
28-1908	**Nuts, Bolt Heads and Spanners,** Report on	1/-	1/2
29-1909	**Steel Forgings for Marine Purposes,** Specification for Ingot	1/-	1/2
30-1907	**Steel Castings for Marine Purposes,** Specification for	1/-	1/2
31-1910	**Steel Conduits for Electrical Wiring,** Specification for	1/-	1/2
32-1907	**Steel Bars** for use in **Automatic Machines,** Specification for	1/-	1/2

LIST OF PUBLICATIONS—*continued.*

Report No.		Net.	Post free.
33	**Carbon Filament Glow Lamps,** Specification for	5/-	5/2
34	**Screw Threads,** Tables of British Standard Whitworth, British Standard Fine and British Standard Pipe Threads (REVISED FEBRUARY, 1913)	Withdrawn.	
35	**Copper Alloy Bars** for use in **Automatic Machines,** Specification for	2/6	2/9
36	**Electrical Machinery,** Report on (Superseded by No. 72–1917)... ...	Withdrawn.	
37	**Electricity Meters,** Specification for (REVISED AUGUST, 1915)... ...	7/6	7/9
38-1913	**Limit Gauges for Screw Threads,** Report on Standard Systems for	1/-	1/2
39	**Screw Threads,** Combined Reports on (REVISED NOVEMBER, 1908) ...	Withdrawn.	
40-1908	**Cast Iron Low Pressure Heating Pipes,** Specification for Spigot and Socket	1/-	1/2
41	**Cast Iron Flue or Smoke Pipes,** Specification for Spigot and Socket...	2/6	2/8
42	**Steam Engines for Electrical Purposes,** Report on Reciprocating	5/-	5/2
43	**Boiler Tubes,** Specification for Charcoal **Iron** Lap-welded...	2/6	2/8
44-1909	**Cast Iron Pipes for Hydraulic Power,** Specification for ...	1/-	1/2
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46-1909	**Keys and Keyways,** Specification for	1/-	1/2
47	**Steel Fishplates** for Bull Head and Flat Bottom Railway Rails, Specification and Sections of (REVISED DECEMBER, 1914)	10/6	10/9
48-1909	**Wrought Iron** of Smithing Quality for Shipbuilding (Grade D), Specification for	1/-	1/2
49	**Ammeters and Voltmeters,** Specification for	5/-	5/2
50	**Locomotives for Indian Railways,** Third Report on (Superseding Nos. 5 and 26)	21/-	21/5
51	**Wrought Iron** for use in Railway Rolling Stock ("Best-Yorkshire" and Grades A, B and C), Specification for (REVISED AUGUST, 1913)	10/6	10/9
52	**Lampholders and Caps,** Specification for Bayonet Socket	Under Revision.	
53-1913	**Boiler Tubes** for Locomotive Boilers, Specification for Cold Drawn Weldless **Steel**...	1/-	1/2
54	**Screw Threads, Nuts and Bolt Heads** for use in **Automobile** Construction, Report on	2/6	2/8
55	**Copper and Bronze Wire,** Report on Hard Drawn	10/6	10/9
56	**Yield Point** and **Elastic Limit,** Definitions of	Gratis.	-/2
57	**Small Screws,** Report on Heads for...	2/6	2/8
58	**Cast Iron Soil Pipes,** Specification for Spigot and Socket	5/-	5/3
59	**Cast Iron Waste and Ventilating Pipes** (for other than Soil Purposes), Specification for Spigot and Socket	5/-	5/3
60	**Tungsten Filament Glow Lamps** (Parts 1 and 2), Report on Experiments on	21/-	21/6
61	**Copper Tubes** and their **Screw Threads** (primarily for domestic and similar work), Specification for ...	2/6	2/9
62	**Marine Boiler Stays, Screwing** for	Gratis.	-/2
63-1913	**Broken Stone and Chippings,** Specification for Sizes of ...	1/-	1/2
64	**Fishbolts and Nuts** for Railway Rails, Specification for	5/-	5/2
65-1914	**Salt-Glazed Ware Pipes,** Specification for...	1/-	1/2
66	**Copper-Alloy Three-Piece Unions** (for Low and Medium Pressure Screwed Copper Tubes), Specification for	5/-	5/3
67	**Ceiling Roses,** Specification for Two- and Three-Plate	5/-	5/2
68	**Steel Conductor Rails,** Method of Specifying the **Resistance** of ...	10/6	10/8
69	**Tungsten Filament Glow Lamps** (Vacuum Type) for **Automobiles,** Report on...	2/6	2/8
70	**Pneumatic Tyre Rims** for Automobiles, Motor Cycles and Cycles, Report on...	5/-	5/3
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78-1917	**Cast Iron Pipes** and Special Castings for **Water, Gas** and **Sewage,** Specification for	1/-	1/3
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84-June, 1918.	**B.S.F. (British Standard Fine) Screw Threads,** and their **Tolerances,** Report on ...	1/-	1/2
85-April, 1918,	**Steel** for **Aircraft,** for **Government Purchases** in the **United States of America,** Specifications for	1/-	1/2

INTERIM REPORTS

Report No.		Net.	Post free.
C.L. 2582	**Ball Journal Bearings,** Interim Report on Sizes of Single Row	Gratis	-/2
C.L. 3750	**French Metric Screw Threads** for **Aircraft** Purposes ...	-/6	-/8